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bcc
Subject Next Steps -- Columbia River Temperature TMDL

Hi Elin,

In case you get an opportunity to touch base with Bob Lohn or Steve Wright or other peers in Portland (like Ren Lohoefener or Colonel O'Donovan), here is my thinking on where we are with the TMDL.

First some history. EPA's role under the CWA relative to water quality standards is to produce guidance; the states actually do the standard setting, and hopefully they do so consistent with our guidance. For temperature, because the national guidance was not considered to be adequate for our specific Northwest emphasis on salmon, we (EPA, Region 10) prepared our own temperature guidance. As you might imagine, this was a big job for our region. The process of producing the Regional Temperature Guidance took over three years and involved the formation of an interdisciplinary team of technical experts from federal, state, and tribal agencies, along with extensive formal scientific peer review. NOAA/NMFS and FWS were a big part of that effort, mostly out of their Portland offices.

We adopted our temperature guidance in 2003. Bob Lohn sent a letter endorsing the guidance, but pointing out the potential need for site-specific considerations and raising some concern about temperature and "large federal dams." Here's a link to Bob's letter.

A couple more points about temperature. I tend to think of temperature as a sort of 'super criterion' when it comes to healthy ecosystems. For example, rivers in their natural condition tend to be colder than rivers altered extensively by us. Rivers that meander are generally colder than rivers straightened out (or at least colder at the right times and in the right places). Rivers through the deep natural forests tend to be colder than rivers through clear cuts. Rivers with healthy vegetated river banks tend to be colder than rivers where livestock have trampled the banks or fields are plowed right to the river's edge. You get the idea. Also, our criteria clearly recognize that natural variation exists. Our criteria are not a 'one size fits all' scheme. While the numbers in the criteria do track the best current scientific information regarding needed water temperatures for the different life stages of salmon, the criteria also reflect that under natural conditions, temperature patterns (the thermal regime) varied across rivers and streams. The criteria embrace this natural thermal variation by explicitly allowing for natural conditions to trump the numeric criteria. So, if one can show that the Salmon River, for example, naturally exceeds our criteria in certain reaches during the summertime, then that natural condition would become the accepted temperature. Presumably, the salmon have adapted over the millennia to conditions in the Salmon River, and our temperature criteria should respect that natural order. Of course, there can be a debate about what is 'natural.'

One of the things we have learned as part of developing the temperature guidance is that small improvements are important. Temperature is important in salmon biology because it affects all life stages of these fish and has many indirect affects. It directly affects spawning, rearing, feeding, metabolic processes including growth, and overall survivability. Further, the incidence and intensity of some diseases are directly related to increased water temperatures. Indirect effects of increased water temperature include changing food availability, increasing competition for feeding and rearing habitat, and enhancing the habitat for predatory fishes. I am attaching a table that provides more information of the impact of small temperature differences.

Oregon and Washington have now adopted temperature standards consistent with our regional temperature guidance. We approved the Oregon standards in 2004 (and are in litigation with environmental groups over that approval), and we are working to approve the Washington standards soon. On the TMDL front, Oregon has moved out with several large, basin-wide TMDLs based on the new T

standards, including the Willamette and Umpqua basins. Washington is a little behind in this regard, partly due to the fact that they don't yet have EPA approved new temperature standards, and it is the standards and resulting listing of impaired waters that drives the TMDL workload.

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Finally, the states of Idaho, Oregon, and Washington all wrote letters to us stating their intent not to prepare the Columbia River temperature TMDL and asking that we conduct the necessary analysis and (in the case of Oregon and Washington) adopt the TMDL. I understand Idaho intends to adopt it themselves based on our analysis. These statements of intent from our states are important, because 303(d) places the obligation to prepare TMDLs on the states; their letters establish our authority to do this work.

Our current plan is to meet with the Corps of Engineers and the Bureau of Reclamation (the major operators of federal dams on the Snake and Columbia rivers) and discuss various ways for moving forward with the TMDL work. We have extensive scientific background from our earlier (2000 - 2002) effort. The Corps and the Bureau raised significant technical and policy concerns with that work. The purpose of our September 25-26 meeting in Portland is to begin to explore if we can get past the issues that prevented progress in the past. The Corps has suggested the overall structure for this meeting and subsequent meetings. Specifically, they would like to start at the policy level and focus on the major policy issues that we have struggled with. After working through some of these larger policy issues (e.g., Should our TMDL analysis include waters in Canada? Could we assume that dams are part of the natural landscape? and so forth), then we would set up a second meeting to involve our technical staff and begin to focus on the modeling and other technical issues. Our goal is to work through these policy and technical concerns, then set about trying to move forward to update the previous draft TMDL.

For this first round of meetings, we are keeping the conversation within the federal family. When we get started updating the TMDL, we would need to involve our state and tribal partners in the effort. We have not yet discussed exactly how to do that.

It is possible that strident opposition from the Corps and/or the Bureau will continue in spite of our best efforts to reach agreement on the policy and technical concerns. That will be the time for us to regroup and decide on our best course of action. However, once we decide to re-start the process we should be resolved to carry on whether or not we have Corps and Bureau concurrence. They are the regulated community; we are the experts and the authorities on TMDLs. The meetings with them are to get on the same page with them and to listen to any new information/ideas that may change and improve our course of action, but I don't want to give the impression that we are seeking their permission to move forward. In developing the original TMDL we met many times with members of the regulated community, including the Corps and the Bureau, and made many changes to our course of action in response to information and suggestions from them.

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The Table below shows that small changes in temperature have a meaningful affect on salmon. For many effects the documented difference between temperature causing initial concern and that causing serious concern is 2 degrees. Initial concern is the level that may cause an effect. Serious concern is the level that very likely causes an effect.

Table 4.6: Summary of the effects of increased water temperature on the important fish species of the Columbia River basin.

Effect/Concern - Salmonids	Water Temperature (C)	
	Initial Concern	**Serious Concern**
Increased mortality to eggs incubating in the gravel1	14	-
Abnormal egg/larval development resulting from the exposure of adults to high temperatures1	15	17
Impaired juvenile pre-smolt physiology, excluding growth		
- Chinook salmon	>14	-
- Sockeye salmon	>15	-
- Coho salmon	>14	-
- Steelhead trout	>14	-
Impaired adult bull trout physiology	>12	-
Impaired smoltification, slows or halts outmigration		
- Chinook salmon	13	15
- Sockeye salmon	13	15
- Coho salmon	14	17
- Steelhead trout	12	14
- Bull trout	-	-
Reduced growth by juveniles1	18	21
Reduced growth by subadult and adult bull trout	16	18
Reduced juvenile distribution		
- Chinook salmon	17 - 18	20 - 22
- Sockeye salmon	-	-
- Coho salmon	15	18
- Steelhead trout	-	20 - 22
Reduced distribution of subadult and adult bull trout	13 - 14	16 - 18

Increased disease	15 - 16	18 - 20
Adult migration stopped1	-	21
Adult bull trout migration and holding impaired	16	-
Effect/Concern - Non-Salmonids	**Initial Concern**	**Serious Concern**
White sturgeon fail to reproduce or have an unsuccessful 3 - week incubation	>17	>18